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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Holger Stark

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EXAMINER

WALTERS, RYAN J

ART UNIT

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3726

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,887	Applicant(s) STARK ET AL.	
	Examiner RYAN J. WALTERS	Art Unit 3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21, 23-32 and 34-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21, 23-32, and 34-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/14/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. Note that in the information disclosure statement filed 7/14/2010, foreign reference DE 19804053 is crossed out because this reference has already been listed and considered in the IDS filed on 5/18/2006.

Claim Objections

2. **Claims 41 and 43** are objected to because of the following informalities: Note that Claim 41 should be dependent on claim 40; Claim 43 should be dependent on claim 42. These changes correspond to the claim renumbering from the previous set of claims and should be made to avoid antecedent basis occurrences. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 21-30 and 36-45 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. **Claim 21** recites the limitation "the force transmission element" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim.

6. The term "essentially" in **claim 38** is a relative term which renders the claim indefinite. The term "essentially completely" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one

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of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. **Claims 21, 23-30, 36-39, 42 and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Bonesteel (US 5,458,314).**

9. Re **Claim 21**, Bonesteel discloses a method for manufacturing a lightweight valve 10c with a valve stem,

a hollow valve cone and

a valve disk 14 closing the valve cone 24b (Fig. 8; Col. 3, lines 27-42),

the method comprising:

producing a first one-piece component 44 forming the valve disk 14 with the force

transmission element 12c by casting, forming and/or a powder metallurgy method;

producing a second one-piece component 46 forming the valve stem 12d and the valve

cone 24b, the second one-piece component 46 having an inner wall defining a hollow

space within the valve stem 12d and the valve cone 24b (Fig. 8; Col. 3, lines 27-42);

and

joining the first and second components together by placing the force transmission

element 12c into the hollow space, bringing the inner wall and force transmission

element into contact and connecting the first and second components by at least one of

a material, non-positive and positive connection (Fig. 8; Col. 3, lines 27-42).

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10. Re **Claim 23**, Bonesteel discloses the force transmission element 12c projects in a dome-like manner above a flat side of the valve disk facing the valve cone (Fig. 8).

11. Re **Claim 24**, Bonesteel discloses the force transmission element 12c is arranged centrally on the valve disk (Fig. 8).

12. Re **Claim 25**, Bonesteel discloses the stem hollow space is provided with an axial stop against which the force transmission element 12c is applied with an end face (Fig. 8).

13. Re **Claim 26**, Bonesteel discloses the axial stop is a fully circular shoulder (Fig. 8).

14. Re **Claim 27**, Bonesteel discloses the axial stop has a surface extending in a plane that is perpendicular to a longitudinal central axis of the valve stem (Fig. 8).

15. Re **Claim 28**, Bonesteel discloses the force transmission element has a constant cross section over an entire length (Fig. 8).

16. Re **Claim 29**, Bonesteel discloses a free end of the force transmission element is inclined (Fig. 8).

17. Re **Claim 30**, Bonesteel discloses the free end is tapered (Fig. 8).

18. Re **Claim 36**, Bonesteel discloses the force transmission element has an end face with a blind hole (Fig. 8).

19. Re **Claim 37**, Bonesteel discloses the valve cone is formed by a tulip-shaped widening of the end of the valve stem (Fig. 2).

20. Re **Claim 38**, as best understood, Bonesteel discloses a connection between the force transmission element and valve stem is designed so that forces acting on the

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valve disk during operation are introduced essentially completely via the force transmission element into the valve stem (Fig. 8; Col. 3, lines 27-42).

21. Re **Claim 39**, Bonesteel discloses the valve disk has a supporting portion against which the valve cone bears flat in sections in an end region of greater diameter (Fig. 8).

22. Re **Claim 42**, Bonesteel discloses the valve cone and the valve disk are welded together (Fig. 8; Col. 3, lines 27-42).

23. Re **Claim 45**, Bonesteel discloses that the valve disk has a recess defined therein that has an edge region including an edge step and the joining step includes engaging an end of greater diameter of the hollow valve cone in the recess of the valve disk and welding the valve cone in the recess (Fig. 8; Col. 3, lines 27-42).

24. **Claims 21, 24, 29-32 and 36-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Laimbock (AT 005131U1, from IDS).**

25. Re **Claims 21 and 31**, Laimbock discloses a method for manufacturing a lightweight valve with a valve stem 2,
a hollow valve cone 3 and
a valve disk 4 closing the valve cone,
the valve stem 2 being provided with a hollow space at an end facing the valve disk 4,
the valve disk 4 also having a force transmission element 5/9 extending through the hollow valve cone into the stem hollow space (Figs. 1-5),
the method comprising:
producing a first one-piece component forming the valve disk 4 with the force transmission element 5/9 by casting, forming and/or a powder metallurgy method;

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producing a second component forming the valve stem 2 and the valve cone 3, (Figs. 1-5); and

joining the first and second components together and connecting the first and second components by at least one of a material, non-positive and positive connection (Figs. 1-5)

wherein the force transmission element 5/9 has a bearing surface extending in a direction of a longitudinal central axis of the force transmission element and bears flat against a correspondingly designed countersurface of the stem hollow space after the first and second components are joined together, the bearing surface and countersurface both having a conical shape (Figs. 1-5).

26. Re **Claim 24**, Laimbock discloses the force transmission element is arranged centrally on the valve disk (Figs. 1-5).

27. Re **Claim 29**, Laimbock discloses a free end of the force transmission element is inclined (Figs. 1-5).

28. Re **Claim 30**, Laimbock discloses the free end is tapered (Figs. 1-5).

29. Re **Claim 32**, Laimbock discloses the bearing surface also bears against an inner wall of the hollow valve cone (Figs. 1-5).

30. Re **Claim 36**, Laimbock discloses the force transmission element has an end face with a blind hole (Figs. 1-5).

31. Re **Claim 37**, Laimbock discloses the valve cone is formed by a tulip-shaped widening of the end of the valve stem (Figs. 1-5).

Claim Rejections - 35 USC § 103

32. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

33. **Claims 31-32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonesteel (US 5,458,314) in view of Laimbock (AT 005131U1, from IDS).**

Re **Claim 31**, Bonesteel discloses a method for manufacturing a lightweight valve 10c with a valve stem,

a hollow valve cone and

a valve disk 14 closing the valve cone 24b,

the valve stem 12d being provided with a hollow space at an end facing the valve disk 14, the valve disk 14 also having a force transmission element 12c extending through the hollow valve cone into the stem hollow space (Fig. 8; Col. 3, lines 27-42),

the method comprising:

producing a first one-piece component 44 forming the valve disk 14 with the force transmission element 12c by casting, forming and/or a powder metallurgy method;

producing a second component 46 forming the valve stem 12d and the valve cone 24b, (Fig. 8; Col. 3, lines 27-42); and

joining the first and second components together and connecting the first and second components by at least one of a material, non-positive and positive connection (Fig. 8; Col. 3, lines 27-42)

wherein the force transmission element 12c has a bearing surface extending in a

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direction of a longitudinal central axis of the force transmission element and bears flat against a correspondingly designed countersurface of the stem hollow space after the first and second components are joined together (Fig. 8).

Bonesteel does not disclose the bearing surface and countersurface both having a conical shape.

However, **Laimbock** teaches a similar method for manufacturing a lightweight valve including a bearing surface and countersurface both having a conical shape (Figs. 1-5). It would be obvious to one of ordinary skill in the art to have the surfaces in a conical shape, as taught by Laimbock, for the purpose of attaining an optimal geometry and also since it would have been an obvious matter of design choice to make the surfaces of whatever form or shape was desired or expedient. A change in form or shape is generally recognized as being within the level of ordinary skill in the art, absent any showing of unexpected results. *In re Dailey et al.*, 149 USPQ 47.

34. Re **Claim 32**, Bonesteel discloses the bearing surface also bears against an inner wall of the hollow valve cone (Fig. 8).

35. Re **Claim 34**, Bonesteel discloses the countersurface is provided with at least one recess for forming a positive connection between force transmission element and valve stem (Fig. 8).

36. Re **Claim 35**, as best understood, Bonesteel discloses the recess is formed as an annular groove (Fig. 8).

37. **Claims 40-41 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonesteel (US 5,458,314) in view of Sternberg (US 4,513,701).**

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38. Re **Claims 40-41 and 44**, Bonesteel does not disclose the valve stem is subsequently inductively hardened in an end region facing away from the valve disk or that an outer surface of the lightweight valve is provided with a protective layer by plating.

However, **Sternberg** teaches a valve stem 2 is subsequently inductively hardened in an end region facing away from the valve disk 1 and that an outer surface of the lightweight valve is provided with a protective layer by plating (Figs. 1-3; Col. 2, lines 16-25). It would be obvious to one of ordinary skill in the art to inductively harden the valve stem and provide a protective layer, as taught by Sternberg, for the purpose of creating a hardening depth in the material of the valve stem (Col. 2, lines 20-21), thereby increasing the strength of the stem.

39. **Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bonesteel (US 5,458,314) in view of Sternberg (US 4,513,701).**

40. Re **Claim 43**, Bonesteel discloses the valve cone and the valve disk are welded together but does not explicitly disclose they are welded together by beam welding or fusion welding.

However, **Griffin** teaches valve components 12, 42 are welded together by beam welding or fusion welding (Fig. 1; Col. 7, lines 25-33). It would be obvious to one of ordinary skill in the art to have the valve cone and the valve disk welded together by beam welding or fusion welding, as taught by Griffin, for the purpose of securely attaching the valve components (Col. 7, line 32).

Response to Arguments

41. Applicant's arguments with respect to claims 21-45 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

42. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN J. WALTERS whose telephone number is (571)270-5429. The examiner can normally be reached on Monday-Friday, 9am-5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. J. W./
Examiner, Art Unit 3726

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726